DOCUMENT RESUME

ED 135 633 SE 022 005

AUTHOR Kiehl, Charles F.
TITLE Competency Based Teacher Education Certification Program in Mathematics 7-12, Provisional.
PUB DATE Sep 76
NOTE 64p.

EDRS PRICE MF-$0.83 HC-$3.50 Plus Postage.
DESCRIPTORS Curriculum; *Curriculum Guides; Higher Education; Instruction; *Mathematics Education; *Methods Courses; *Performance Based Teacher Education; Preservice Education; Program Descriptions; Teacher Education

ABSTRACT

In this packet of materials, the outline for State University College at Brockport's certification program for secondary school mathematics teachers is given. First, an overview of the program is presented, then specific skills, knowledges, and attitudes are identified and assessment procedures, conditions, and standards are listed. Information about student guidance, program evaluation, and program management is provided. The final section lists the responsibilities of the college, the school system, the preservice teachers, and the cooperating teachers with regard to the certification program. (DT)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED135633

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

COMPETENCY BASED TEACHER EDUCATION

CERTIFICATION PROGRAM

IN

MATHEMATICS 7 - 12

PROVISIONAL

Editor/Major Author - Charles F. Kiehl
State University College, Brockport, New York

Contributors:

State University College, Brockport, New York

Morris Beers
Norman Bloch
Robert Hall
Ralph Jordan
Dennis Martin
Theron Rockhill

Greece Central School District, Greece, New York

William Camann
Patrick Hoke
Virginia Magill
Donald Ramsey

SE 022 005

COMPETENCY BASED TEACHER EDUCATION CERTIFICATION

PROGRAM IN MATHEMATICS 7 - 12

PROVISIONAL

TABLE OF CONTENTS

I. Cover Sheet - - - - - - - - - - - - - - - - - - i

II. Program

A. Analysis and Statement - - - - - - - - - 1

B. Requirements for Entrance - - - - - - - 4

C. Expected Skills, Knowledge and Attitudes - - - - - - - 4

D. Assessment - - - - - - - - - - - - - - - 4

E. Student Guidance - - - - - - - - - - - - 29

F. Program Evaluation and Management - - 30

III. Involvement - - - - - - - - - - - - - - - - - - 32

I. COVER SHEET

A. Date: September 1, 1976

B. Name of College:

State University College at Brockport

C. Name of Patricipating School District:

Greece Central School District

D. Title of New York State Certificate:

Mathematics, 7 - 12

E. Level of Certificate:

Provisional

F. Degree(s):

Bachelor of Science

Bachelor of Arts

G. Anticipated Date of Program Implementation:

September 1, 1977

II. PROGRAM

A. Analysis and Statement

The Program described in this proposal is designed to lead to provisional teacher certification in mathematics, 7-12. The program is competency-based and field oriented. The competency-based format provides an explicit statement of the performances required for certification and the field orientation emphasizes that the knowledge, skills and attitudes assessed will be directly related to classroom practices.

The Skills, Knowledge and Attitudes (SKA) of the Programs were developed by applying the guidelines and recommendations set forth by the Board of Regents and the Association of Mathematics Teachers of New York State.

The Skills, Knowledge and Attitudes (SKA) have been separated into three (3) areas as recommended by AMTNYS. The areas are:

1. Mathematics
2. Teaching - Learning Strategies
3. Humaneness in Mathematics Classrooms

The first numeral in the SKA listing will identify the area.

The Regent's Ten Goal statements, which focus on the needs of pupils in the schools, are addressed in the teacher preparation competencies.

The goal of SUC Brockport's Secondary Mathematics CBTE Program is to produce a teacher of mathematics with a broad liberal arts base who is also competent in mathematics and in the teaching of mathematics. In addition

to successful completion of specific competencies, each CBTE candidate must complete the requirements for a baccalaureate degree, a major in mathematics and the professional education sequence as determined by the college before being recommended for provisional certification.

The competent teacher at the provisional level must have a basic knowledge of algebra, analysis, geometry, and probability and statistics. The mathematics major with a course in geometry will usually allow the candidate to acquire such competencies. The purpose of the algebra competencies is to understand the structure of finite operations such as addition while the analysis competencies cover the infinitary processes required to better understand the real numbers and other mathematical systems. The geometry competencies cover non-numerical structure and the concept of space relationships while the competencies in probability and statistics enable one to make decisions in the face of uncertainty and to organize data. Currently, the subject of geometry is in a state of change as the transformational approach is being tried. For provisional certification, competency in either the transformational approach or the traditional approach to geometry is sufficient.

Mathematics content competencies will be assessed in specific upper level mathematics courses. (Courses identified by course number)

PROGRAM FOR SECONDARY MATHEMATICS CERTIFICATION

Provisional Certification BA or BS - Mathematics Major (30 hrs. Mathematics)

Algebraic Structure	Analysis Concepts	Concepts of Probability and Statistics (Basic)
Linear Algebra I	Calculus I Calculus II Calculus III	
MTH 425 Modern Algebra I	MTH 457 Real Analysis I	MTH 445 Prob. & Stat. I

AND

Geometric Concepts

Traditional Approach		Transformational Approach
MTH 432/532 College Geometry	OR	MTH 434/534 Transformational Geometry

Professional education competencies will be assessed generally in the context of a total classroom situation rather than through completion of a multitude of small discrete acts which demonstrate the SKA necessary in teaching mathematics. A variety of courses to develop broad areas of SKA is required of all students. The competencies to be assessed will encompass those SKA developed within these broad areas, but concentrate on mathematics content and the teaching of mathematics.

Provisional Certification - BA or BS (Mathematics Major)

Knowledge of Pedagogy	Teaching Performance	Rolls and Expectation of Public School Personnel
EDI 322 Methods in Secondary Mathematics	EDI 308 Practicum in Secondary Education	EDI 309 Selected Problems in Secondary Education

Competencies would normally be tested in the courses identified above by course number. In addition students are required to complete PSH 384 - Developmental Psychology and one of the college approved courses in Drug Education (HLS 370, HLS 491, HLS 301) for provisional certification.

B. Requirements for Entrance into the Teacher Education Program

A student must be of Junior status in good standing with the college (minimum of 2.0 index).

C. Expected Skills, Knowledge and Attitudes

The expected Skills, Knowledge and Attitudes for Provisional Certification of Teachers of Secondary School Mathematics are listed in column one on pages 5 through 28.

D. Assessment

The Assessment Procedures, Conditions, and Standards for Provisional Certification of Teachers of Secondary School Mathematics are listed in columns two, three, and four on pages 5 through 28.

Skills, Knowledge, Attitudes	Assessment Procedures	Assessment Conditions	Assessment Standards
1.11 Algebraic Structure	Written Evaluation Oral Evaluation	MTH 425 or test administered by Mathematics Department Evaluation Committee	1. The student will determine if a given set together with an appropriate number of operations is (a) a group (b) a ring (c) an integral domain (d) a field (e) a vector space. 2. The student will determine if a a given subset of each of the structures listed in (1) is a substructure. 3. The student will determine if a given function from each of the structures listed in (1) to a structure of the same type is (a) a homomorphism (b) an isomorphism. 4. The student will give examples, in terms of the complex number system, of the structures, substructures and functions appearing in (1) (2) (3). 5. The student will state and give illustrative examples of the following results for R(x) (a) Division Algorithm (R a field) (b) Factor Theorem (R an integral domain) (c) Rational Root Theorem (R = Rational numbers)

Skills, Knowledge, Attitudes	Assessment Procedures	Assessment Conditions	Assessment Standards
1.21 Analysis Concepts	Written Evaluation Oral Evaluation	MTH 457 or test administered by Mathematics Department Evaluation Committee	1. The student will list a set of axioms that characterize the real number system, and demonstrate the equivalence of at least three formulations of the axiom of continuity. 2. The student will determine if (i) a sequence (ii) a function has a limit and prove his/her assertion. 3. The student will determine if a given function is (i) continuous (ii) differentiable and prove his/her assertion. 4. The student will state and give a geometric justification for (i) Intermediate Value Theorem (ii) Extreme Value Theorem (iii) Mean Value Theorem. 5. The student will state two equivalent formulations of the definite integral and outline the proof of their equivalency and will state and prove the two Fundamental Theorems of Calculus.

Skills, Knowledge, Attitudes	Assessment Procedures	Assessment Conditions	Assessment Standards
1.21 Analysis Concepts (Continued)			6. The student will construct an indefinite integral of any function from the class of elementary functions. 7. The student will determine the derivatives of functions using the constant, sum, difference, product, quotient and chain rules. 8. The student will evaluate indefinite integrals using the constant, sum, difference, substitution and parts rules. 9. The student will verify that the the set of all continuous, differentiable, or integrable functions defined on a closed interval constitute a vector space and that differentiation and integration are linear transformations. 10. The student will formulate the concept of infinite series and will test convergence using the elementary tests.

Skills, KNowledge, Attitudes	Assessment Procedures	Assessment Conditions	Assessment Standards
1.31 Concepts of Probability and Statistics (Basic)	Written Evaluation Oral Evaluation	MTH 445 or test administered by Mathematics Department Evaluation Committee	1. Give a probability experiment and a random variable associated with it, the student will determine its probability distribution or density function and compute probabilities of events associated with the experiment (possibly with the aid of tables or by approximation techniques). 2. Given a random variable, the student will compute its mean, variance and standard deviation. 3. Given two events or random variables, the student will determine whether or not they are independent. 4. Given suitable experimental data, the student will compute sample mean and sample variance and establish confidence intervals for unknown means. 5. The student will state and discuss the meaning and implications of Bayes' Theorem and Chebychev's Inequality.

Geometric Concepts

The student will meet the Geometric competencies required in either 1.41 (Transformational Approach) or 1.42 (Traditional Approach).

Skills, Knowledge, Attitudes	Assessment Procedures	Assessment Conditions	Assessment Standards
1.41 Geometric Concepts Transformational Approach	Written Evaluation Oral Evaluation	MTH 434 or test administered by Mathematics Department Evaluation Committee	1. The student will define and use the concepts of line of symmetry, point of symmetry, translation, rotation, reflection, and glide reflection. 2. The student will find the group of symmetries for a given geometric figure and give the subgroups. 3. The student will demonstrate a knowledge of the General Affine Group and its subgroups and their relevance to geometry including: a. The group of isometries of the plane and its application to problems involving the congruence of geometric objects. b. The group of homotheties and its application to problems involving similarities of geometric objects. and c. The group of shears and its application to problems involving area preserving transformations of geometric objects.

Geometric Concepts

The student will meet the competencies required in either 1.41 (Transformational Approach) or 1.42 (Traditional Approach)

Skills, Knowledge, Attitudes	Assessment Procedures	Assessment Conditions	Assessment Standards
1.42 Geometric Concepts Traditional Approach	Written Evaluation Oral Evaluation	MTH 432 or test administered by Mathematics Department Evaluation Committee	1. The student will determine if a given function on pairs of points is a Euclidean Metric. 2. The student will give an axiom system for Euclidean (Parabolic) Geometry and will show how to modify this axiom system to produce axiom systems for Elliptic and Hyperbolic Geometry. 3. The student will demonstrate the relative consistency of the two Non-Euclidean Geometries and will demonstrate a knowledge of the completeness of the axiom system for Euclidean Geometry given in 2 above. 4. Given statements, the student will determine if each is true in Euclidean Geometry and will modify each into statements in each of the two Non-Euclidean Geometries and will determine if the modified statements are true in each of these. 5. The student will give and use a definition of angle and angle measure.

Skills, Knowledge, Attitudes	Assessment Procedures	Assessment Conditions	Assessment Standards
1.42 Geometric Concepts Traditional Approach (Continued)			6. The student will explain the definition of equivalence and for a given geometric property develop the notion of equivalence with respect to that property. 7. The student will construct and analyze coordinate systems in the plane.

Skills, Knowledge, Attitudes	Assessment Procedures	Assessment Conditions	Assessment Standards
2.11 States long-range goals and objectives for a selected secondary school mathematics course, plans and evaluates a unit to achieve those goals and objectives.	Given a specific course, the student will write the long-range goals, and plan a unit to achieve those goals and objectives.	College Class School Classroom	The student will select a general goal of education and describe in concrete terms how mathematics can contribute to the attainment of that goal. He will plan and devise a way to evaluate educational experiences in mathematics to help secondary students achieve the qualities or abilities described in the general goal, and a way to assess their degree of achievement. The written unit plan will consist of: 1. Introduction 2. Goals 3. Objectives 4. Materials and/or equipment list 5. Daily lesson plans including homework assignments 6. Applications 7. Tests 8. Bulletin boards and/or displays (Description of material or material to be used).

Skills, Knowledge, Attitudes	Assessment Procedures	Assessment Conditions	Assessment Standards
2.12 Writes specific objectives, cognitive and affective. Plans a lesson to achieve desired objectives for children of different abilities, including a homeowrk assignment.	Given a mathematical topic the student will write an appropriate set of objectives, lesson plan, and teach the lesson including appropriate homework experiences.	College Class School Classroom	The student will write objectives in terms of student behavior, explicit, and observable. The student will plan a lesson to achieve the desired objectives for children of different abilities and backgrounds. Such planning should take into account both mathematical and pedagogical conditions and evidence of these should be demonstrated in planning the lesson.
2.13 Defines and explains the rationale and differences among expository, guided discovery/inductive, and inquiry approaches.	Paper and pencil test Written report Oral report	College Class School Classroom	Adequacy judged by instructor based on 80% accuracy in consistency of explanation to basic components of the approaches.
2.14 Writes a lesson plan which includes alternate teaching strategies for a given topic, such as the multiplication of integers a. rote b. pattern formation c. proof etc.	Given a specific topic the student will outline in writing strategies for attaining the objectives	College Class School Classroom	The student will submit at least 3 strategies, mathematically and pedagogically correct, which may be used to teach assigned topic.

Skills, Knowledge, Attitudes	Assessment Procedures	Assessment Conditions	Assessment Standards
2.15 Prescribes appropriate enrichment or remedial work based on an evaluation of individual students.	Written report Oral report	College Class School Classroom	The student will: 1. prescribe appropriate enrichment materials and/or work for specific individuals or a specific group of individuals. 2. prescribe appropriate remedial materials and/or work for specific individuals or a specific group of individuals. The report will include a rationale for lesson, instructional objectives, procedures, content, and assessment devices.
2.16 Tutors a student deficient in Math	Demonstration	College Class School Classroom	The student will maintain a tutorial relationship with a student and help him to improve in a given area of weakness.
2.17 Writes specific mathematical question illustrating different cognitive levels in questioning strategies	Lesson plans Demonstration	College Class School Classroom	Evaluator will certify that the written questions are illustrative of at least four different cognitive levels, according to a taxonomy of objectives.

Skills, Knowledge, Attitudes	Assessment Procedures	Assessment Conditions	Assessment Standards
2.21 Teachers a lesson to achieve pre-determined objectives for children of different abilities.	Demonstration	School Classroom	The student will teach a class which is consistent with the predetermined objectives and the range of ability of the students in the class. The varying degrees of participation by the students must be shown in such things as: use of materials teacher-student interaction including questioning, acceptance of ideas or answers assignments evaluation of lesson
2.22 Demonstrates ability to use a variety of teaching techniques (i.e., questioning discovery, lecture, etc.) in the classroom.	Demonstration Paper-pencil test or interview	School Classroom	The student will: 1. Select and use at least two different teaching techniques with a class of students. 2. Given a hypothetical situation, choose at least 2 alternate techniques to be used.
2.23 Demonstrates ability to use various media in instruction to achieve a predetermined objective.	Demonstration	School Classroom	The student will use media (films, records, filmstrips, slides, TV programs, etc.) in meeting the objectives of the lesson.
2.24 Demonstrates ability to teach a fact, definition or algorithm by rote to a class of students.	Demonstration	School Classroom	On a test -- 80% of the class must demonstrate knowledge of that which was learned by "rote".

Skills, Knowledge, Attitudes	Assessment Procedures	Assessment Conditions	Assessment Standards
2.25 Effectively incorporates a variety of questioning strategies.	Demonstration	School Classroom	The student will, in at least three lessons, ask questions of pupils distributed in all of the following categories: a. eliciting broad response from pupils b. checking information or previously learned comprehension c. exploring for additional information or inference d. pursuing logical consistency or supporting evidence for argument.
2.26 Provides for the development and/or practice of skills and concepts in Mathematics	Demonstration	School Classroom College Class	The student will provide opportunities to practice in class to reinforce a skill or concept taught to the class.
2.27 Expresses ideas and information clearly and articulately	Demonstration	School Classroom	Two independent assessors certify that over a period of at least three weeks the student expresses ideas and information so that a. vocabulary level is appropriate for pupils b. words are clearly enunciated c. voice projects adequately d. ideas are expressed in logical sequence e. abstractions unfamiliar to pupils are clarified by examples f. usage of grammar and syntax does not interfere with communication and that student accepts criticisms and attempts to remedy oral or written deficiencies.

Skills, Knowledge, Attitudes	Assessment Procedures	Assessment Conditions	Assessment Standards
2.31 Identifies and describes characteristics of, and procedures for, the following techniques and materials: a. simulation gaming b. small group discussion c. "brainstorming" d. programmed instruction e. films, sound filmstrips, video tapes f. sound tapes, records g. film strips, slides, pictures, cartoons h. textbooks, newspapers, other reading material i. large group discussion j. field trips k. maps, charts, graphs, time lines	Paper and Pencil tests Lesson Plans Small group discussion	College Class School Classroom	Evaluator judges adequacy based on student's ability to cite procedures, advantages or disadvantages of each technique and material.
2.32 Demonstrates that he can: a. prepare and run off a ditto b. operate a slide or film strip projector c. make an overhead transparency d. operate an overhead projector e. use a chalkboard and appropriate mathematical aids (compass, straight-edge, protractor, etc.) in conjunction with a lesson (classroom presentation)	Demonstration	College Class School Classroom	The student will: a. prepare a ditto to be used in class in conjunction with a lesson b. operate a filmstrip or slide projector in a classroom setting c. prepare an original transparency and use with a projector in a classroom setting d. write and construct on chalkboard in a legible manner with appropriate organization of written materials.

Skills, Knowledge, Attitudes	Assessment Procedures	Assessment Conditions	Assessment Standards
2.33 Selects appropriate teaching aids for instruction and teach a class using these aids.	Demonstration	College Class School Classroom Special Materials Center in Library	The student will select from a variety of teaching materials (both commercial and homemade), from pamphlets to experimental devices, an appropriate aid which is used in teaching a mathematics class. Student must use the overhead projector as one of the aids and one other aid.
2.34 Produces an instructional packet for individualized learning.	Written evidence Packet	College Class School Classroom	The student will include in the instructional packet behavioral objectives, guide questions, activities, and evaluation procedures.
2.41 Develops measuring devices (tests) for assessing student achievement. Uses teacher constructed materials to assess the ability level of individuals in a secondary mathematics class.	After teaching and/or writing a plan for teaching a unit, student will write an assessment instrument. He will then use the materials to assess the ability level of students in a specific class.	College Class School Classroom	The student will: a. develop one or more assessment instruments employing different types of test questions (multiple-choice, true-false, completion, etc.) for mathematics. b. apply one or more teacher constructed instruments. c. correctly interpret and assess individual students based on use of the instrument(s). d. show the instruments are appropriate to the content and for the students. e. determine whether the instruments are valid and reliable.

Skills, Knowledge, Attitudes	Assessment Procedures	Assessment Conditions	Assessment Standards
2.42 Evaluates mathematics achievement of (a) individual pupil (b) a class of students, and prescribe appropriate activities for (1) an individual pupil and (2) a class of students.	Written report Oral report	College Class School Classroom	Evaluator certifies that on three separate occasions student a. selected assessment means appropriate to the objectives of the pupil learnings to be evaluated. b. prepared suitable directions, test questions, (where appropriate) and criteria for evaluation of pupil response. c. administered or directed assessment procedure. d. corrected student response, using previously stated criteria. e. evaluated results, including item analysis, in terms of learning objectives. f. made necessary prescriptions and retaught.
2.43 Uses professionally prepared assessment instruments to evaluate the performance of his students.	Demonstration	School Classroom	The student will choose instruments which are appropriate to the content and for the students.
2.44 Writes a rationale for evaluating student performance	Written report	College Class	Adequacy judged by instructor based on inclusion in report of applying student needs, teacher goals and societal needs.
2.45 Lists types of assessment procedures.	Paper and Pencil test	College Class	Adequacy judged by instructor based on student's achieving 80% accuracy.

Skills, Knowledge, Attitudes	Assessment Procedures	Assessment Conditions	Assessment Standards
2.46 Creates various types of assessment devices to evaluate student performances.	Written report	College Class School Classroom	The student will produce assessment devices for evaluating student learning in areas of cognition and affection such as identifying, listing, defining, translating, paraphrasing, extrapolating, analyzing, synthesizing, and evaluating.
2.51 Discusses with his students the results of various assessment instruments.	Demonstration	School Classroom	The student is open and fair in his discussions and demonstrates that he assesses to improve teacher instruction and student performance.
2.52 Discusses with an individual student his progress and competency in a specific mathematics topic as a result of administering a specific evaluation instrument or making specific homework or classroom assignment.	Interview with student or Simulation	School Classroom	Evaluator satisfaction that student: a. correctly interprets results b. communicates the interpretation correctly c. uses the results as a basis for counseling, motivation, and self-evaluation.
2.61 Student evaluation (self) teaching effectiveness	Interview with college staff or supervising teacher at the conclusion of teaching a unit of Secondary Mathematics. Written report Oral report	School Classroom	The prospective teacher will develop and refine criteria he may use to evaluate his own instructional strategies and performance and will be able to adapt his teaching performance in accordance with his evaluation. He will use audio and/or video tape recordings of his teaching objectives and his actual teaching performance -- between the learning objectives and the learning outcomes.

Skills, Knowledge, Attitudes	Assessment Procedures	Assessment Conditions	Assessment Standards
2.62 Analyzes own capabilities and limitations.	Conferences with assessors	School Classroom	Two independent assessors certify that in a series of separate conferences over a period of at least two weeks the student satisfactorily a. cited own successful behaviors, advancing rationale for success b. cited own unsuccessful behavior, advancing rationale for lack of success
2.63 Revises instructional strategies on the basis of new knowledge and feedback.	Demonstration	School Classroom	The student willingly changes instructional strategies to improve them on the basis of feedback from an analysis of a lesson by student, cooperating teacher, at least one peer, and instructional specialist (professor).
2.64 Engages in peer evaluations of his teaching and having internalized the responses received.	The student and two peers will participate in evaluating each other's lesson and discuss the results with their cooperating teachers and a college supervisor	School Classroom	Students will establish criteria before teaching lessons and make assessments in terms of these criteria. Results will be shared with cooperating teacher and college supervisor.
2.65 Plans for instruction with fellow professionals	Demonstration	School Classroom	The evaluators will certify that over a period of one month, the student is willing to accept ideas of others and is open to suggestions when planning with students, teachers and clinical professors.

Skills, Knowledge, Attitudes	Assessment Procedures	Assessment Conditions	Assessment Standards
2.66 Exhibits democratic principles and cooperative behavior in professional relationships with other members of the school staff.	Demonstration	School Classroom	Two independent assessors certify that behavior of student is characterized by a. sensitivity to, and respect for for, the self-concept of staff members b. good rapport with other staff members c. initiative in assisting other staff members as appropriate.
2.67 Seeks and uses suggestions for professional improvement.	Conferences with assessors, peers and other staff	College Class or School Classroom	Two independent assessors certify the student has consistently a. initiated attempts to acquire knowledge and skills to improve self professionally b. sought evaluation of own performance c. accepted criticism without undue defensiveness d. applied suggestions to own behavior.

Skills, Knowledge, Attitudes	Assessment Procedures	Assessment Conditions	Assessment Standards
3.11 Maintains classroom atmosphere conducive to learning mathematics	Demonstration The activity and desired atmosphere to be pre-determined with evaluator. (College staff or supervising teacher).	School Classroom	The student will demonstrate knowledge of and ability to apply sound mathematics classroom management principles including: a. the development of mathematical experiences and activities relevant to the "real-life" of the child b. developing skill at working with small and large groups c. spontaneity, creative thinking and self-directed learning d. optimal learning opportunities for self-discipline, and positive and strong self-worth e. mutual trust between and the ability to communicate with teachers, students and parents f. establish a situation enabling a math student to have the chance to gain respect and appreciation for differences within peer group g. demonstrate sensitivity to the impact of teacher verbal and non-verbal communications on others h. demonstrate fairness, tact, compassion and sound judgement in dealing with students.

Skills, Knowledge, Attitudes	Assessment Procedures	Assessment Conditions	Assessment Standards
3.12 Anticipates and responds to pupils who differ from the norms.	Role play with peers assessed by peers and professor Given a written description of a critical incident where he/she must respond through words and actions	College Class School Classroom	Student will demonstrate acceptable action for the situation given.
3.13 Identifies with pupils, what is usual or unusual behavior and means to respond to these behaviors.	Discussion with cooperating teacher or professor	School Classroom	Student will state the process used to determine usual and unusual behavior with pupils.
3.21 Identifies intellectual, psychological, social, and cultural factors which affect students' learning.	Written evidence Oral evidence	College Class School Classroom	Student will identify and describe factors which affect student' learning, such as I.Q., personality, social level, and cultural background.
3.22 Anticipates and responds to problems in the classroom.	Analysis of lessons between student and cooperating teacher	School classroom	Student will describe at least three instances where he/she has taken the initiative to solve some typical problem which had arisen in the classroom. Cooperating teacher will verify.

Skills, Knowledge, Attitudes	Assessment Procedures	Assessment Conditions	Assessment Standards
3.31 Practices sensitivity to, and respect for, individual differences in treatment of students.	Lesson Plans Demonstration	School Classroom	Two independent assessors certify that: a. submitted lesson plans state objectives, techniques, and assessment means which provide for differing abilities of students b. analysis of student verbal behavior on a total of four separate occasions is learner-centered according to either Flanders, Withall or other appropriate systems of verbal analysis of social-emotional climate.
3.32 Demonstrates positive attitudes and behaviors towards pupils.	Anecdotal record of relationships with pupils demonstration	School Classroom	Instructor certifies that anecdotal record indicates student exhibits positive attitudes and behaviors towards students.
3.41 Demonstrates varied methods of encouraging students to respond constructively in the mathematics classroom.	Demonstration	School Classroom	Evaluator certifies that several methods (guided discussion, student discussion, written responses, oral interpretation, etc.) were used effectively in eliciting constructive student responses.

Skills, Knowledge, Attitudes	Assessment Procedures	Assessment Conditions	Assessment Standards
3.42 Lists and defines major concerns of public secondary school administration.	Written evidence	College Class School Classroom	The student will describe major responsibilities of secondary school administrators in such areas of curriculum, faculty, students, and finances.
3.43 Identifies school resource personnel available to better help students (counselors, psychologists, etc.).	Given a specific school situation, the student will identify available personnel resources assisting with student problems.	College Class School Classroom	Satisfaction of evaluator on the following: a. given a specific school resource person, the student can identify that person's duties and responsibilities b. given a hypothetical problem situation, the student can identify available resource personnel that can assist with the problem.
3.51 Knows content of a school district's policies, regulations, and procedures.	Written Report	College Class School Classroom	Using handbooks and written statements of Policies and Regulations of a specific school district, the student will state a teacher's responsibility in such areas as: a. attendance b. fire drills c. assembly procedures d. discipline e. supervision f. lunch room g. dismissal h. etc.

Skills, Knowledge, Attitudes	Assessment Procedures	Assessment Conditions	Assessment Standards
3.52 Lists and defines major professional and legal responsibilities of secondary school teachers.	Written Evidence	College Class School Classroom	The student will describe major professional and legal responsibilities of secondary school teachers in such areas as academic freedom, conditions of employment and tenure.
3.53 Specifies and ranks what is perceived to be the school's primary concerns (e.g., budgets, innovations, discipline, development of skills, etc.)	Written Report	College Class School Classroom	The student will write a rank ordered list which must include at least the following: budgets, innovations, discipline, development of skills.

MATHEMATICAL COMPETENCIES FOR SECONDARY MATHEMATICS CERTIFICATION (Summary)

Provisional Certification BA or BS - Mathematics Major - 30 hrs. of Mathematics

Algebraic Structure	Analysis Concepts	Concepts of Probability and Statistics (Basic)
Linear Algebra I	Calculus I Calculus II Calculus III	
MTH 424 Modern Algebra I	MTH 457 Real Analysis I	MTH 445 Probability and Statistics I

AND

Geometric Concepts

Traditional Approach		Transformational Approach
MTH 432/532 College Geometry	OR	MTH 434/534 Transformational Geometry

EDUCATIONAL COMPETENCIES FOR SECONDARY MATHEMATICS CERTIFICATION (Summary)

Provisional Certification BA or BS (Mathematics Major)

Knowledge of Pedogogy	Teaching Performance	Roles and Expectations of Public School Personnel
EDI 322 Methods in Secondary Mathematics	EDI 308 Practicum in Secondary Education	EDI 309 Selected Problems in Secondary Education

Competencies would normally be tested in the courses identified above by course number. In addition students are required to complete PSH 384 - Developmental Psychology and one of the college approved course in Drug Education (HLS 370, HLS 491, HLS 301) for provisional certification.

E. Student Guidance

Applicants for Provisional Certification in Secondary Mathematics will receive program advisement from both the Department of Mathematics and from the Department of Curriculum and Instruction. Prior to admission to the program, the student will be provided with appropriate college handbooks and with the details of the specific competencies, assessment procedures and assessment criteria of the program as well as information as to how these competencies can be attained. Advisement then takes the role of continuing re-evaluation of the student's progress and recommendations for alternate directions within the general framework of the program, with more intensive advisement and counselling during the professional semester.

A mathematics major declaring an intent to pursue secondary mathematics certification will be assigned a mathematics certification advisor. This faculty member from the mathematics department will help the student plan a program of study to fulfill the requirements for the baccalaureate degree and the major as well as meeting the specific competencies in mathematics. This advisor will keep a record of mathematical competencies completed by the student and will advise the student as to appropriate evaluation procedures.

The Advisement Coordinator for the Department of Curriculum and Instruction will explain the certification requirements of the Program, and the options available within the Program. The Advisement Coordinator

will initially counsel the candidate concerning the selection of appropriate course work prior to the professional semester. As soon as feasible, the applicant, with the guidance of the Advisement Coordinator, will select an Education Certification Advisor from among the Department of Curriculum and Instruction faculty members designated as Secondary Certification Program Advisors in mathematics education.

The applicant, the Certification Advisors, and the Advisement Coordinator will at all times have an up-to-date record of the applicant's progress in the program.

F. Program Evaluation and Management

1. Procedures for Collecting and Reviewing Information about Student Performance

   a. A record of the student's performance in Methods of Secondary Mathematics will be kept by the college instructor and transmitted to the student's Program Advisor and Advisement Coordinator.

2. Procedures Designed to Facilitate Program Modification

   At the end of each college semester, representatives from all parties involved in the preparation of Mathematics teachers, 7-12, for provisional certification will be invited to evaluate the effectiveness of the present competencies and to recommend new ones to be added. Such personnel will include college Mathematics faculty members, college Mathematics Education

faculty members, college clinical professors, public school teachers and supervisors, and college undergraduate mathematics certification students. On the basis of recommendations from such representatives, the program of competency-based education for Secondary Mathematics teachers may be modified by an ad hoc committee of the policy board.

3. Plan for Gathering Information about Applicability of the Required Skills, Knowledge, and Attitudes in the School Setting covered in F. 2.

III. INVOLVEMENT

A. Rights and Responsibilities of the Interested Parties for Program Implementation.

The parties of this project (the State University of New York, College at Brockport, the Greece Central School District and the Greece Teachers' Association) agree to conduct a Competency-Based Teacher Education Program. The parties herein referred to as the College, the School District, and the Teachers' Association enter into this program full cognizant of and in accord with the following conditions:

1. All shall fulfill their obligations to the student trainees as their joint and separate responsibilities to train students in the art and science of teaching, to assess their progress, and to evaluate periodically the teacher education program herein described.
2. The college is primarily responsible for the overall education and training of their students, with the School District and the Teachers' Association joining in the professional education and training of said students. For provisional certification, the School District and Teachers' Association are parties to the teacher education program development, performing certain supervisory and counseling functions during the field experiences of the students and sharing with the College the assessment of certain student performances described herein.

3. The members of this consortium -- the College, the School District, and the Teachers' Association -- will form a Policy Board to govern the program.

   a. Policy Board Function

      The Policy Board will assess and evaluate the program as herein described and prescribe changes as they become necessary. The Policy Board has elected the Dean for Social Professions, State University of New York at Brockport, to act as its official designee to recommend applicants for provisional certification to the New York State Department of Education.

   b. Policy Board Composition

      The Policy Board shall consist of two representatives from the College, one representative from each School District, and three representatives from each Teachers' Association. These representatives vote within their respective agencies in matters pertaining to the Policy Board's functions outlined above. A majority vote within the agency dictates the direction of the agency unit. All agencies must agree to changes in governance policy.

4. Students' Rights and Responsibilities

   a. The student is a legal enrollee of the College and as such must comply with the policies and regulations governing

student activities and program requirements which are made explicit in college descriptions of program requirements.

b. The student, when engaged in field experiences at the Cooperating School District, is responsible for regulations formulated by the School District as well as those required by the College.

c. The student shall not be used regularly by the School District or their personnel as sources of paraprofessional or clerical help, nor shall he or she supplant regularly employed teachers of the School District.

5. Cooperating Teachers (School District Personnel)

Cooperating teachers volunteer to be assigned as field associates to work with teacher education candidates in guided experiences which are planned to account for the levels of readiness and needs of the teaching candidates. This assignment shall be in accord with the State University of New York College at Brockport's policies and procedures.

6. The School and College

In order to provide close liaison, coordination and continuous feedback as to program objectives, implementation, and assessment, a Site Committee will be formed in each school district where any component of the program is in operation. Such a committee will consist of representatives of the College,

representatives of the Teachers' Association, and of the School District Administration. Decisions by the Site Committee are constrained by all directives from the State Education Department and the Policy Board. The role of the Site Committee is to provide decentralized and flexible decision making within general policy limits.

7. College Personnel

College personnel will serve the following functions:

a. Act as advisors and inform students of program objectives and expectations.

b. Serve as Clinical Professors on the Site Committee.

c. Serve as Coordinators of Field Experiences and make the necessary arrangements for assigning students to school sites.

d. Make provisions for the cooperating teachers to receive necessary training related to the guidance, supervision, and evaluation of preservice students.

8. The School District and the College

These parties shall be responsible for orienting students and teachers to this competency-based program and for informing both participating and non-participating teachers about development, implementation, and progress of the programs. The School District and College shall do this only after having

consulted with representatives from the Teachers' Associations.

9. College

The Department of Curriculum and Instruction at the State University of New York College at Brockport will maintain a record-keeping system which will provide data on the progress of the students.

The following letters indicate the full cooperation and involvement in the development of the various aspects of the Competency-Based Teacher Education Program described herein.